We claim:

1. A purified peptide comprising at least 5 consecutive amino acids of an amino acid sequence selected from the group consisting of Seq. I.D. Nos. 1 and 9.

2. A purified peptide according to claim 1 wherein the peptide comprises at least 10 consecutive amino acids of an amino acid sequence selected from Seq. I.D. Nos. 1 and 9.

3. A purified peptide according to claim 1 wherein the peptide comprises the amino acid sequence shown in Seq. I.D. No. 1.

4. A purified peptide according to claim 1 wherein the peptide comprises the amino acid sequence shown in Seq. I.D. No. 4.

5. A purified peptide according to claim 1 wherein the peptide comprises the amino acid sequence shown in Seq. I.D. No. 9.

6. A specific binding agent that specifically binds a peptide having an amino acid sequence selected from the group consisting of Seq. I.D. Nos. 1, 4 and 9.

7. A specific binding agent according to claim 6 wherein the specific binding agent is selected from the group consisting of polyclonal antibodies, monoclonal antibodies and immunologically active fragments of monoclonal antibodies.

8. A specific binding agent according to claim 6 wherein the specific binding agent is conjugated with a detectable label.

9. A method of quantifying the level of expression of a 15 kDa selenoprotein in a biological sample, the method comprising contacting the sample with a specific binding agent according to claim 6 under conditions whereby the specific binding agent forms a complex with any 15 kDa selenoprotein present, and quantifying said complexes.

10. A method of detecting the presence of a 15 kDa selenoprotein in a biological sample, the method comprising contacting the sample with a specific binding agent according to claim 6 under conditions whereby the specific binding agent forms a complex with any 15 kDa selenoprotein present, and detecting the presence of said complex.

11. A kit for detecting or quantifying a 15 kDa selenoprotein, the kit comprising a container containing a specific binding agent according to claim 6.

12. An isolated nucleic acid molecule that encodes a polypeptide comprising an amino acid sequence as set forth in Seq. I.D. Nos. 1, 4 or 9.

13. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the sequences shown in the group consisting of Seq. I.D. Nos. 2, 3 and 8.

14. A recombinant nucleic acid vector including a nucleic acid sequence according to claim 13.

15. A transgenic cell produced by introducing into a cell a vector according to claim 14.

16. A method of generating the purified peptide encoded by the nucleic acid vector of claim 14 by introducing the vector into a cell and expressing the peptide from the cell.

17. The purified peptide of claim 16 wherein the peptide has an amino acid sequence selected from the sequences shown in the group consisting of Seq. I.D. Nos. 1 and 9.

18. A purified mammalian 15 kDa selenoprotein.

19. A method of detecting the presence of a nucleic acid molecule that encodes a 15 kDa selenoprotein in a biological sample, comprising:

(a) contacting the sample with an oligonucleotide comprising at least 15 consecutive nucleotides of a sequence selected from the group consisting of Seq. I.D. Nos. 2 and 8 under conditions whereby said oligonucleotide will specifically hybridize to any nucleic acid molecule present in the sample that encodes a 15 kDa selenoprotein; and

(b) detecting the presence of such hybridization.

20. A nucleic acid probe specifically hybridizable to a human 15 kDa selenoprotein RNA or cDNA.

21. A method of detecting a polymorphism in a human 15 kDa selenoprotein gene, comprising determining all or part of a nucleic acid sequence of a human 15 kDa selenoprotein gene, cDNA or mRNA in a biological sample.

22. The method of claim 21 wherein the polymorphism is C811/G1125.

23. A method of detecting a polymorphism in a human 15 kDa selenoprotein gene, cDNA or RNA in a biological sample, comprising hybridizing the sample with a nucleic acid probe under conditions whereby the probe will hybridize to the 15 kDa selenoprotein gene, or to cDNA or RNA carrying a polymorphism selected from the group consisting of C811, G1125 and C811/G1125, but not to a wild-type 15 kDa selenoprotein gene, cDNA or RNA.

24. A method of detecting a 15 kDa selenoprotein in a cell, comprising administering to the cell ^{75}Se, and detecting ^{75}Se incorporated into a 15 kDa selenoprotein.

25. A method for dietary regulation, comprising detecting an abnormally low expression of a 15 kDa selenoprotein in the cells of a mammal and, if the level is below normal, enhancing the level by providing additional selenium in the diet of the mammal.

26. The method of claim 25 wherein the detection of a 15 kDa selenoprotein in the cells of a mammal is determined by Western blotting of the 15 kDa selenoprotein.

27. The method of claim 25 wherein the detection of a 15 kDa selenoprotein in the cells of a mammal is determined by Northern blotting of a mRNA coding for the 15 kDa selenoprotein.

28. The method of claim 25 wherein the detection of a 15 kDa selenoprotein in the cells of a mammal is determined by Southern blotting of a DNA encoding for the 15 kDa selenoprotein.

29. A method for dietary regulation, comprising detecting a normal level of a 15 kDa selenoprotein in the cells of a mammal, determining if the mammal is at an increased risk for cancers associated with defects in the 15 kDa selenoprotein and, if the risk is increased, decreasing the mammal's risk by providing additional selenium in the diet of the mammal.

30. A method of determining a genotype of a mammalian 15 kDa selenoprotein gene in a sample comprising:

isolating DNA, cDNA, or mRNA from the sample;

amplifying the DNA, cDNA, or mRNA in a region containing a polymorphism at nucleotide positions 811 and 1125;

digesting the amplified DNA, cDNA or mRNA with restriction enzyme(s) which can distinguish the polymorphism by a differential restriction fragment length; and

detecting the polymorphism by the presence of the differential fragment length.

31. The method of claim 30 wherein the sample comprises a tumor cell.

32. The method of claim 30 wherein the sample comprises a normal cell.

33. The method of claim 30 wherein detecting the polymorphism comprises amplifying a DNA or cDNA of a mammalian 15 kDa selenoprotein gene with an amplification reaction using primers shown in Seq. I.D. Nos. 12 and 13.

34. An oligonucleotide comprising a sequence shown in Seq. I.D. No. 12.

35. An oligonucleotide comprising a sequence shown in Seq. I.D. No. 13.

36. A method of determining a sequence of a polymorphism at positions 811 and 1125 of a mammalian 15 kDa selenoprotein gene by using the oligonucleotides of claims 30 and 31 to amplify a region containing the polymorphism.

37. A transgenic mouse which overexpresses an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the sequences shown in the group consisting of Seq. I.D. Nos. 2, 3, and 8.

38. A transgenic mouse in which a nucleic acid molecule comprising a nucleic acid sequence selected from the sequences shown in the group consisting of Seq. I.D. Nos. 2, 3, and 8, is functionally deleted or reduced.

39. A method of administering a therapeutically effective amount of the protein of claim 18 to a subject with an increased predetermined genetic susceptibility to cancer associated with a polymorphism in a 15 kDa selenoprotein gene, wherein the peptide is administered at a dose that reduces the subject's susceptibility to cancer.

40. The method of 39 wherein the protein is expressed by administering the recombinant nucleic acid vector of claim 14 into a subject with an increased predetermined genetic susceptibility to cancer associated with a polymorphism in a 15 kDa selenoprotein gene, wherein expression of the recombinant nucleic acid in the subject provides a therapeutically effective amount of a 15 kDa selenoprotein to the subject.

41. A composition comprising a therapeutically effective amount of the protein of claim 18 and a pharmaceutically acceptable carrier.